

B. REMARKS.

1. Introduction.

In the Office Action mailed on 25 November 2002, all of claims 1-10 were rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over US Patent No. 6,295,380 to Takahashi (the "Later Takahashi Patent") taken with either US Patent No. 6,181,743 to Bailleul (the "Bailleul Patent") or US Patent No. 5,912,709 to Takahashi (the "Earlier Takahashi Patent").

By this response, Applicant has canceled pending claims 1-10 and replaced them with new claims 11-30, using the new amendment format promulgated by the PTO.

In summary, Applicants do not agree with the Examiner's conclusions on the teachings of the cited art, but have in any event redefined the claims to more clearly recite Applicants' invention.

2. The Present Application.

As explained in Applicants' background section, Applicants faced a problem (given increasing reliance on compressed digital video systems) of providing quick video editing abilities upon a digital video signal, ideally while preserving (1) ability to quickly output a compressed signal, for example a HDTV compliant signal produced in real time, and (2) compatibility with existing digital video standards, especially MPEG-2. To address this problem, as explained in Applicants' detailed description, Applicants have devised a system that independently encodes multiple objects appearing in a video image, all while preserving compatibility with (ideally) the MPEG-2 standards - using this type of implementation allows Applicants' invention, for example, to be applied to many of today's DVD, Internet, gaming, digital broadcast and other compressed TV formats. Operating on a background of a conventional image (i.e., a standard "frame" having a given horizontal width and vertical image height), Applicants' scheme of independently encoded regions calls for 8x8 pixel DCT tiles (a conventional size and format in MPEG-2 processing) of a dependent frame to be constrained during motion search and compensation, so that motion vectors can only point to constrained areas of an "anchor" frame (upon which the dependent frame depends) -- processed in this manner, a resultant compressed output signal "looks" much like any other standard format

signal, e.g., as an agglomeration of objects appearing in a single image with a motion vector and residuals set that represent each "tile" of the video frame.

In order to facilitate quick editing, Applicants' system enables a subset of data in each video frame to be independently extracted from compressed video, edited, and used to formulate an output bitstream without always requiring complete decoding of entire image frames. To accomplish this end in a manner compatible with MPEG-2 and other conventional formats, Applicants' system calls for image slices (the format into which motion vectors and residuals are bitstream encoded, e.g., following quantization and Huffman coding in a MPEG-2 environment) to be formed based on the independently encoded regions - "slices" are typically visible directly from the encoded bitstream, and by arranging slices to correspond to a special data region that is likely to be the subject of editing, Applicants' system thereby has "preformatted" subsets of an image for select extraction, editing and reinsertion without "completely" decoding and decompressing an entire bitstream - as used here, "decoding" refers to taking a bitstream and performing operations (such as inverse Huffman coding and inverse quantization) to at least obtain compressed data (e.g., motion vectors and residuals in the case of a dependent frame), and "decompression" refers to converting information to the image or "spatial domain," i.e., where an image is represented in a spatial format, independent of other frames.

3 The Cited Art.

The cited art does not show Applicants' invention as claimed.

In this regard, the Later Takahashi Patent relates to a system where multiple objects are encoded essentially as separate images or image "planes," i.e., in an object based format - each object is independently encoded essentially as separate images, so there is no issue about separating out "mixed" image data. This format is supported by the newer MPEG-4 format; such "object-based formats," however, are usually incompatible with MPEG-2 and other conventional formats which feature complete "tiled" image frames that are compressed as sequential blocks. The Later Takahashi Patent does not show independently encoded images as recited by Applicants claims, where motion vectors of a dependent frame are constrained to point only to a like region of an anchor frame upon which the dependent frame will be predictively reconstructed. Similarly, the Later Takahashi Patent does not show slicing compressed data for an image in a manner that corresponds to region boundaries (a region may be defined in

dependence upon likely later editing, e.g., an image corner for logo insertion or a foreground object for later extraction and color correction); specially "slicing" a single image in this manner would not be used as an operation in an object-based coding system, where objects are essentially independent streams, and slice information would used by the present invention would have no pertinence to an object-based coding system, where objects are already separated.

The Bailleul Patent relates to a system that apparently calls for complete decoding of an image frame for logo insertion (see, e.g., FIG. 3 of the Bailleul Patent). See also column 5, lines 44-57, and column 6, line 32 - column 7, line 52. Otherwise stated, the Bailleul Patent appears to disclose a system where the entire frame is decoded (from the bitstream) into a motion vector and residual format; and further, where a logo is then inserted without full decompression by mixing values representing a logo into the DCT matrices representing a location where the logo would appear. [Because in a predictive format one dependent frame depends for reconstruction upon another frame, it is necessary in such a system when a logo is added to one frame, it is "compensated for" in a later dependent frame, e.g., so there are no artifacts associated with "two" or more logos.] Unlike the system called for the Bailleul Patent, the present invention calls for extracting select data from the bitstream, which the system of the Bailleul Patent has no means of accomplishing. [DCT based logo processing, as called for by the Bailleul Patent, could be one logo insertion feature used in conjunction with Applicants' invention, e.g., to process independently encoded regions which have been extracted from a bitstream via Applicants' invention, but the Bailleul Patent does not show how to perform this extraction without decoding the entire bitstream.]

Finally, it is respectfully submitted that the Examiner's reading of the Earlier Takahashi Patent (No. 5,912,709) is incorrect - the Earlier Takahashi Patent does not teach decoding data for a region, editing that data, and then combining it with original compressed data for a particular frame, as the Examiner indicates in the Office Action, nor does the Earlier Takahashi Patent teach identifying a location of a region, or of data, or of decompressing only selective portions of a frame. Rather, and with reference to Fig. 7 of that patent, the Earlier Takahashi Patent relates to splicing MPEG-2 data, represented by two separate signals of Figs. 7(a) and 7(b) of that patent - the Earlier Takahashi Patent essentially says that (i) one can preserve compression data before the splice point for the first signal of Fig. 7(a), (ii) one must recode during a transition period represented by three I' frames of Fig. 7(c), and (iii) one may essentially preserve compression data beginning with the period after the transition period, represented by the frames

B'B'P'B'P'B' seen at the end of Fig. 7(c). Basically stated, the Earlier Takahashi Patent relates to a frame-by-frame coding system and does not teach any method of selectively editing data within a frame without decompressing all data within that frame.

Otherwise stated, Applicants' invention is different than any of taught systems of any of the patents relied upon by the Examiner, and the Examiner has misconstrued the Earlier Takahashi Patent.

4. The New Claims.

No new matter has been added by the present amendment, and it is respectfully submitted that although three new independent claim sets are presented, these sets do not satisfy the PTO criteria for restriction.

In particular, independent claim 11 is a method claim that utilizes information identifying a subset of image slices to extract image slices from the bitstream, decode and edit those slices, and reinsert "new" slices back into the bitstream to take the place of replaced bitstream data. The cited art is silent on any procedure for doing this within a given object "plane" or image.

Independent claim 21 is a machine-readable instruction claim having similar limitations, namely, that the instructions cause a system to examine a bitstream to identify a set of image slices, to extra those slices from the bitstream, decode and edit those slices, and to insert resultant "new" slices back into the bitstream.

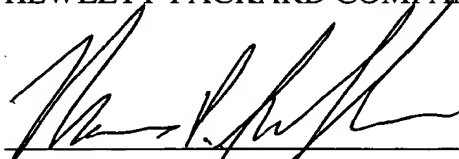
Independent claim 24 is an apparatus claim that recites a video editor and an image slice control system - the image slice control system is adapted to identify a subset of image slices in the bitstream, cause the decoding of the subset for editing, encode edited data (and unedited data which has been decoded, as applicable) and insert the new image slices into the bitstream.

The various dependent claims recite more detailed features of the invention similar to those already presented, e.g., relating to the type of editing performed.

5. Conclusion.

It is respectfully submitted that the invention as claimed is patentable over the art relied upon by the Examiner, and that the present case is in condition for allowance.

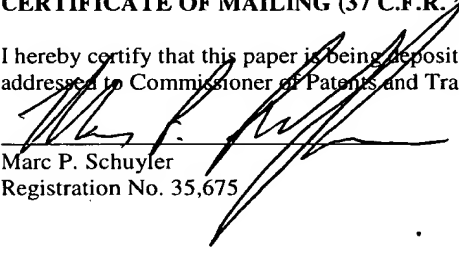
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